Package 'orsk'

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Type Package

Title Converting Odds Ratio to Relative Risk in Cohort Studies with Partial Data Information

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Description Convert odds ratio to relative risk in cohort studies with partial data information (Wang (2013) <doi:10.18637/jss.v055.i05>).

Imports BB, BHH2

Suggests setRNG

License GPL (>= 2)

LazyLoad yes

NeedsCompilation yes

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Contents

orsk *Converting Odds Ratio to Relative Risk in Cohort Studies with Partial Data Information*

Description

Converting Odds Ratio to Relative Risk in Cohort Studies with Partial Data Information

Usage

```
orsk(nctr, ntrt, a=NA, al=NA, au=NA, level = 0.95, type="two-sided",
method = c("grid","optim"), d=1e-4)
## S3 method for class 'orsk'
plot(x, type=c("RR", "OR"), digits=2, factor=1, amount=NULL, ...)
## S3 method for class 'orsk'
print(x, ...)
## S3 method for class 'orsk'
summary(object, nlist=1:5, ...)
```

Arguments

nctr	sample size of control group from a published study
ntrt	sample size of treatment group from a published study
a	estimated odds ratio from a published study
al	lower bound of confidence interval from a published study
au	upper bound of confidence interval from a published study
level	level of confidence interval with default 95%
method	method for converting the odds ratio to the relative risk with default value "grid"
d	threshold value (delta in the vignette) to filter out solutions if sum of squares > d. Only used with method="grid"
type	type of the objective function with default value "two-sided"; or the type of risk to be plotted. For type="RR", distribution of relative risk among scenarios for which the calculated odds ratio and confidence interval coincide with the published values. For type="OR", distribution of risk of the outcome among scenarios for which the calculated odds ratio and confidence interval coincide with the published values.
x	object of class orsk
object	object of class orsk
nlist	maximum number of solutions displayed
digits	rounding accuracy for all the numbers given in the published study, with default value 2
factor, amount	arguments for scatter plot, see ?jitter function
...	additional arguments for print, summary.

Details

Investigators of medical and epidemiological studies are often interested in comparing a risk of a binary outcome between a treatment and control group, or between exposed and unexposed. Such an outcome can be an onset of a disease or a dichotomized length of labor duration.

From a published study, suppose we are given the information on sample size of control group `nctr`, sample size of treatment group `ntrt`, estimated odds ratio `a`, and confidence interval `(al, au)`, how to estimate the relative risk, when the original 2 by 2 contingency table is not directly available? Two methods are proposed to estimate the cells of the contingency table, and to estimate the relative risk.

Value

An object of class `orsk` is returned. The algorithm estimates the number of outcome in control group `ctr_yes`, number of outcome free in control group `ctr_no`, number of outcome in treatment group `trt_yes` and number of outcome free in treatment group `trt_no`. Also the results include the corresponding estimated odds ratio with confidence interval, and relative risk and confidence interval, based on the estimated contingency table.

Author(s)

Zhu Wang

References

Wang, Zhu (2013). Converting Odds Ratio to Relative Risk in Cohort Studies with Partial Data Information. *Journal of Statistical Software*, 55(5), 1–11.
doi: 10.18637/jss.v055.i05

Morris, J.A. and Gardner, MJ (1988). Calculating confidence intervals for relative risks (odds ratios) and standardised ratios and rates. *British Medical Journal*, 296(6632), 1313–1316.

Examples

```
## Not run:
res1 <- orsk(nctr=1636, ntrt=2601, a=2.61, al=2.25, au= 3.03, method="grid")
summary(res1)
res2 <- orsk(nctr=1636, ntrt=2601, a=2.61, al=2.25, au= 3.03, method="optim")
summary(res2)
res3 <- orsk(nctr=1636, ntrt=2601, a=2.61, al=2.25, type="lower", method="grid")
summary(res3)
res4 <- orsk(nctr=1636, ntrt=2601, a=2.61, au=3.03, type="upper", method="grid")
summary(res4)
res5 <- orsk(nctr=1636, ntrt=2601, a=2.61, al=2.25, au=3.03, type="ci-only",
method="grid")
summary(res5)

## End(Not run)
```

zy *Estimating the Relative Risk Based on the Odds Ratio*

Description

Estimating the relative risk based on the (adjusted) Odds Ratio from multiple logistic regression or other multiple regression models. The method was based on Zhang and Yu (JAMA, 1998)

Usage

```
zy(risk, oddsratio)
```

Arguments

risk	the risk rate of having a positive outcome in the control or unexposed group
oddsratio	odds ratio estimated from multiple logistic regression or other multiple regression models

Details

Primarily for the adjusted odds ratio, the estimated relative risk is given by:

odds ratio / (1 - risk + risk * odds ratio)

Value

the estimated relative risk

Author(s)

Zhu Wang

References

Zhang J, Yu KF (1998). What's the relative risk? A method of correcting the odds ratio in cohort studies of common outcomes. *JAMA*, 280(19), 1690-1.

Examples

```
zy(risk=0.18, oddsratio=2.25)
```

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